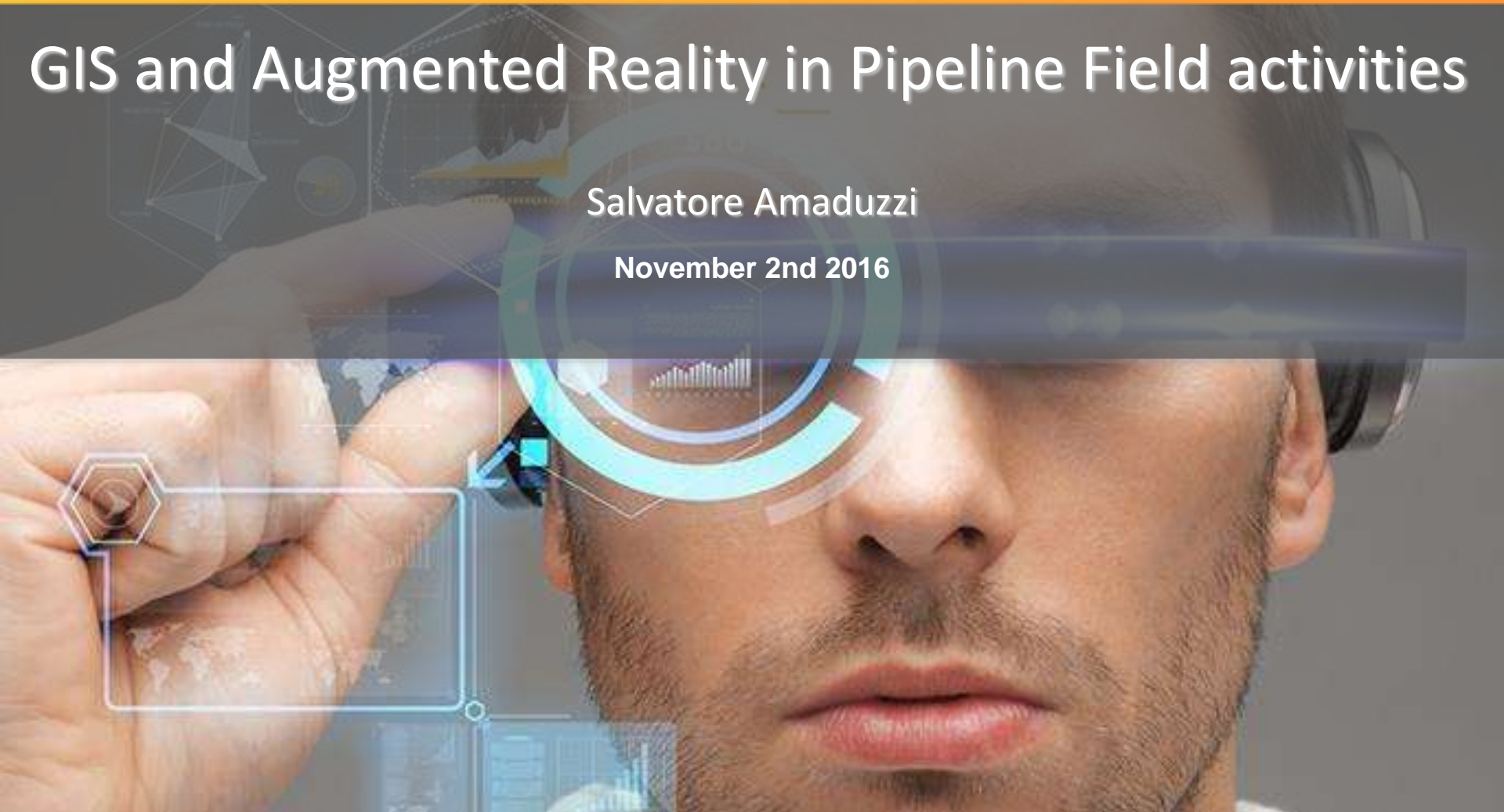


# GIS and Augmented Reality in Pipeline Field activities

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## Our company in brief



# Field, Mobile and GIS solutions



# Gartner's Magic Quadrant for FSM

Since **2014** we are in the  
**Magic Quadrant for Field Service Management**



International  
presence



Constant  
expansion

## Gartner

- Full coverage of **Field Service** and **Asset Management**
- **Complete GIS environment with the deepest integration with ESRI**
- **Advanced mobile platform and integrated to Augmented Reality, Virtual Reality, wearables, and smart garments modules**
- **Innovation** also driven by **clients' needs**
- Proven and **successful deployments**, both **on-premise** and **SaaS**
- **Integration** with leading **ERPs** including **SAP**
- Strong presence in **Europe** and **LATAM**, growing in **North America** and the **Middle East**
- High **costs/benefits** ratio

# FSM and GIS references in the Utility Market



ITALGAS



SNAM RETE GAS

endesa



enel



gasNatural



2i Rete Gas



AcegasAps



a2a

Terna



ASPEM  
Gruppo a2a



ASCOPIAVE



GORI  
GESTIONE  
OTTIMALE  
RISORSE  
IDRICHE



L'energia che fa per te.

iren

SCGEA



LINEA  
DISTRIBUZIONE





# WHY Field Service Management



**Improve efficiency and optimize the activities** carried out by teams



**Fully manage field processes**



**Monitor in real time the progress** of activities and of the **costs**



**Reduce activities accounting time** and **increase the quality** of the information collected



**Ensure compliance to the service level agreements** required by the clients

## Gas to Go: workforce management for Italgas

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# Gas to Go: workforce management for Italgas



**ITALGAS**

- **400** *Coordinators*
- **1,500** *Mobile devices*
- **1,500** *Field technicians*
- **10 mln** *Customers*
- **2 mln** *Appointments/year*
- **600,000** *Interventions/year*
- **100,000** *Interventions on call*



## The innovation

- The first solution in Europe where iPads are used by an Utility for maintenance activities
- Solution developed on Geocall Mobile technology with specific iOS user interface

## Benefits

- Drastic reduction in training time: from 4 days (1 in classroom + 3 on the field) to ½ day in classroom
- Cancellation of support calls for inquiries on application use, which is iPad native, than is very intuitive
- As well as a consumer App, an user manual is not needed
- Positive users' feedback

## Project benefits

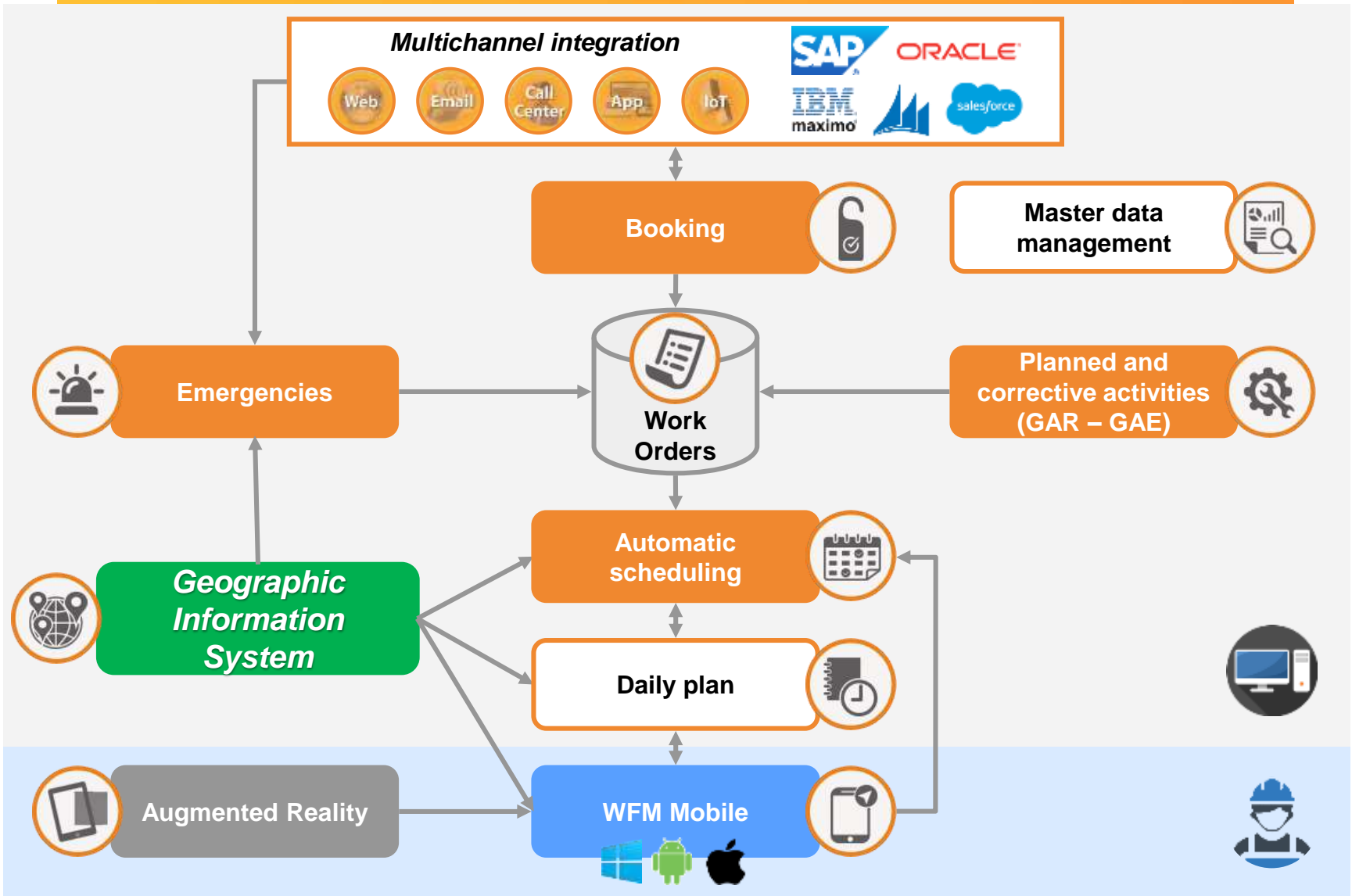
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- **Reduction of daily mileage of around 30%** and reduction of **CO<sub>2</sub> emissions**
- **Increased productivity by 100%** (doubling work hours performed on a daily basis)
- **Reduction in works accounting times** (from 20 days in 2007 to 0.1 days in 2014)
- **Saving of 5 tons of paper** and 12,500 Kwh needed to produce them
- **Mobile** technologies introduced **democratization** for their users

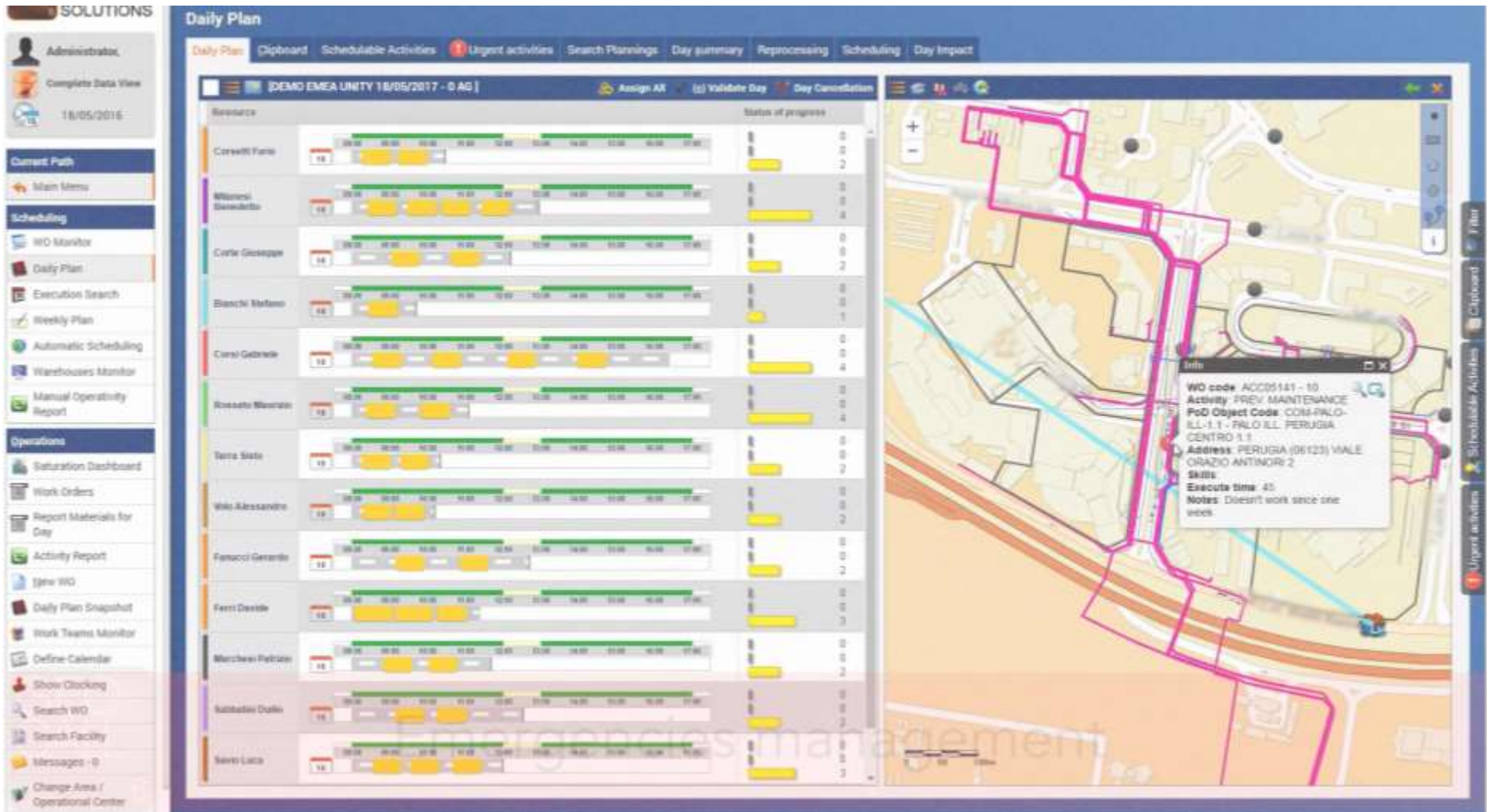




# Field Service Management application flow



# Agenda planning



# High level of configuration

## Resources



Skill



Clock in/out mode



Address at beginning/end of day



Movement type



Calendar



Saturation



Warehouse management



Work team



Facilities



Master data



Scheduling area



Extra work allowed

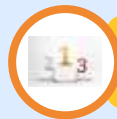
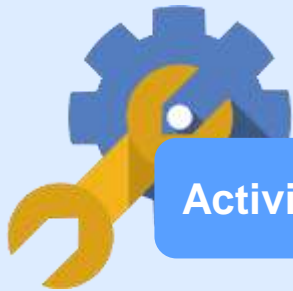


Vehicle



Operations center

## Activities



Priority



Time constraints



Materials



Pre-assignment



Management type



Duration



Dependence



Data collection configuration

# GIS information for FSM in mobility



## Plants

Structure, details, information attributes, multimedia attachments

## Technical objects



Search, georeferentiation, details visualization



## Technological networks

Visualization, information layers and backgrounds, access to technical schemes

## Object positioning



Use of measurement tools and coordinates



## Content sharing

Cooperation of various users on cartography

## Geographic data



Online and offline (mobile) consultation

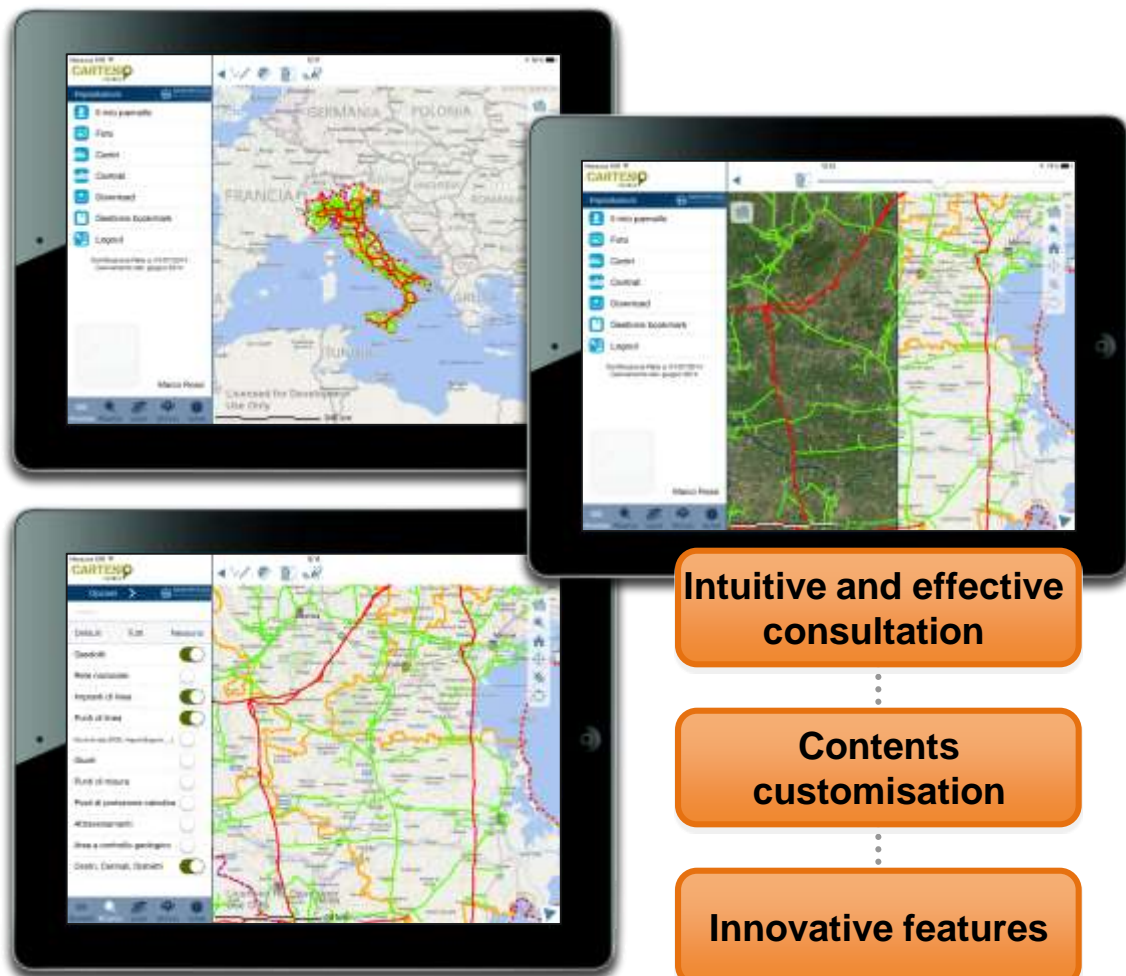




# GIS Mobile

*Consulting company data on cartography multiplatform ONLINE and OFFLINE*

The solution allows to **view the network assets and related attributes (including multimedia attachments)** on iPad, relying on a cartographic App. It is technologically innovative and provides advanced features, such as the possibility to **differentiate and customise the contents** depending on the specific needs (by user and/or area and/or process), to consult data and maps also **offline**, to allow **cartographic collaboration** thanks to dedicated tools (bookmark and redlining).



## GIS and FSM in Mobility

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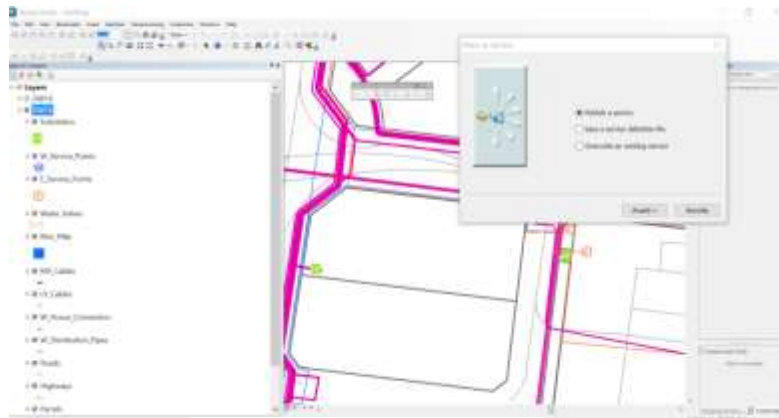


*Click to watch the video*



# Augmented Reality for Field Service Management

*The project is setted up on ArcGIS for Desktop, through a File or an Enterprise Geodatabase, and the services are published as Features Service on ArcGIS Online or ArcGIS for Server with a preconfigured structure*



ArcGIS Online

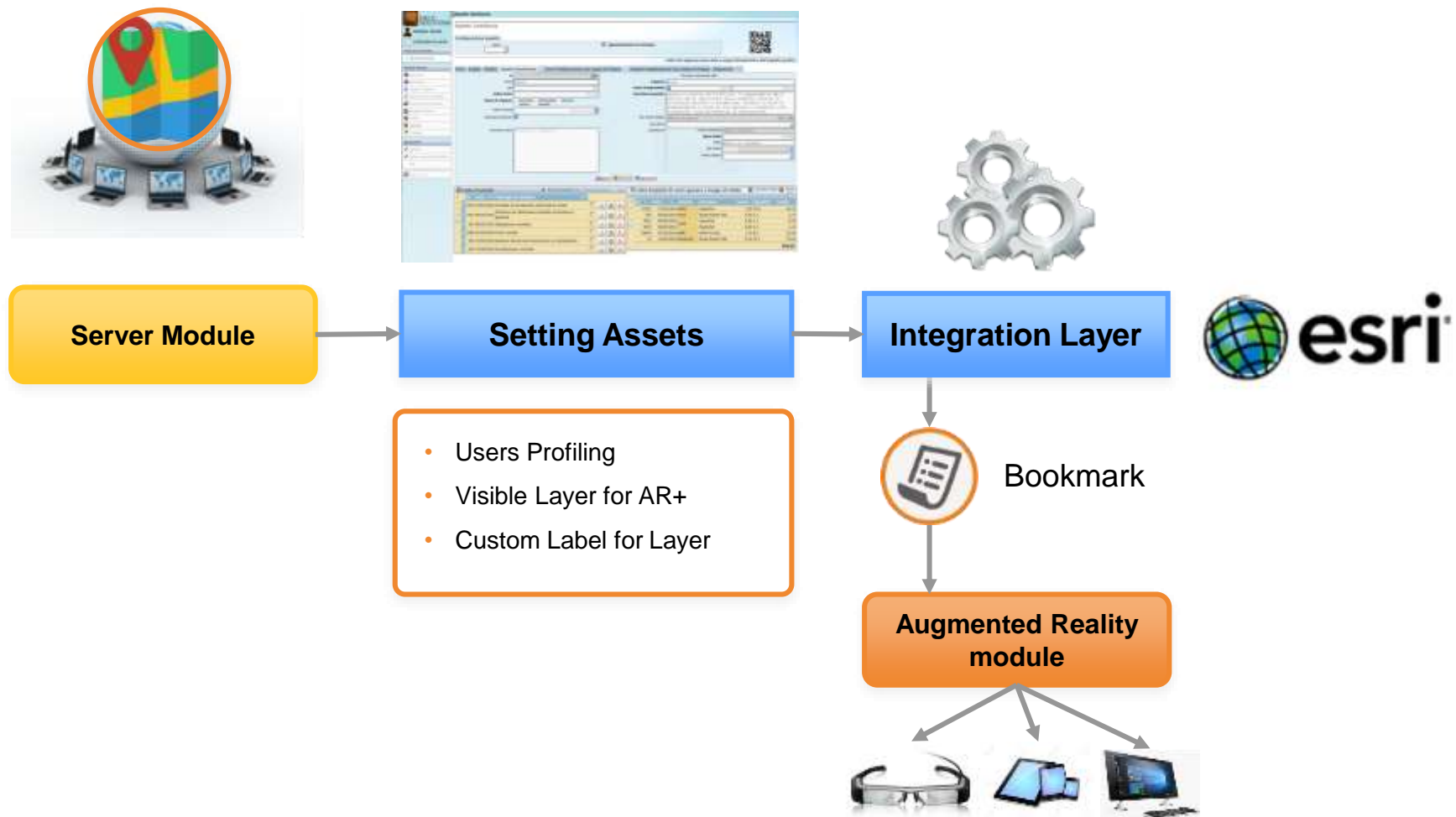


Bookmark

Geocal WFM AR+



# Augmented Reality for Field Service Management



# Augmented Reality for Field Service Management

**Cross Platform support**



**Multi Device Integration**



**Esri services compliant**



# Augmented Reality Module

*Use of Augmented Reality in support of the operational processes performed on field by maintenance teams*



- App integrated with Mobile WFM and enterprise GIS services
- Combined use of GPS, compass and accelerometer to overlay virtual objects onto the real world
- Representation and consultation of information on the assets (attributes, location, technical sheets, installation diagrams, etc.)
- Dynamic and parametric regulation of the displayable contents
- Tracking and orientation for reaching the plants located in arduous areas
- Support to pipeline control (check on the presence of interferences in the pipeline)

## AR Module

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# Augmented Reality for Field Service Management

**Combination** of reality and virtual reality

**Interactive** real time **execution** of the user's inputs

**Alignment** of real and virtual objects

Automatic identification of plants/technical objects



Security equipments verification



Indoor orientation (emergency procedures)



Localization of underground networks



**Isolated plants reachability (3D orientation)**



Guided interactive maintenance procedures



**Increase in the perception of the working environment and reduction in the complexity of the activities being carried out**



## AR Module

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# Esri City Engine

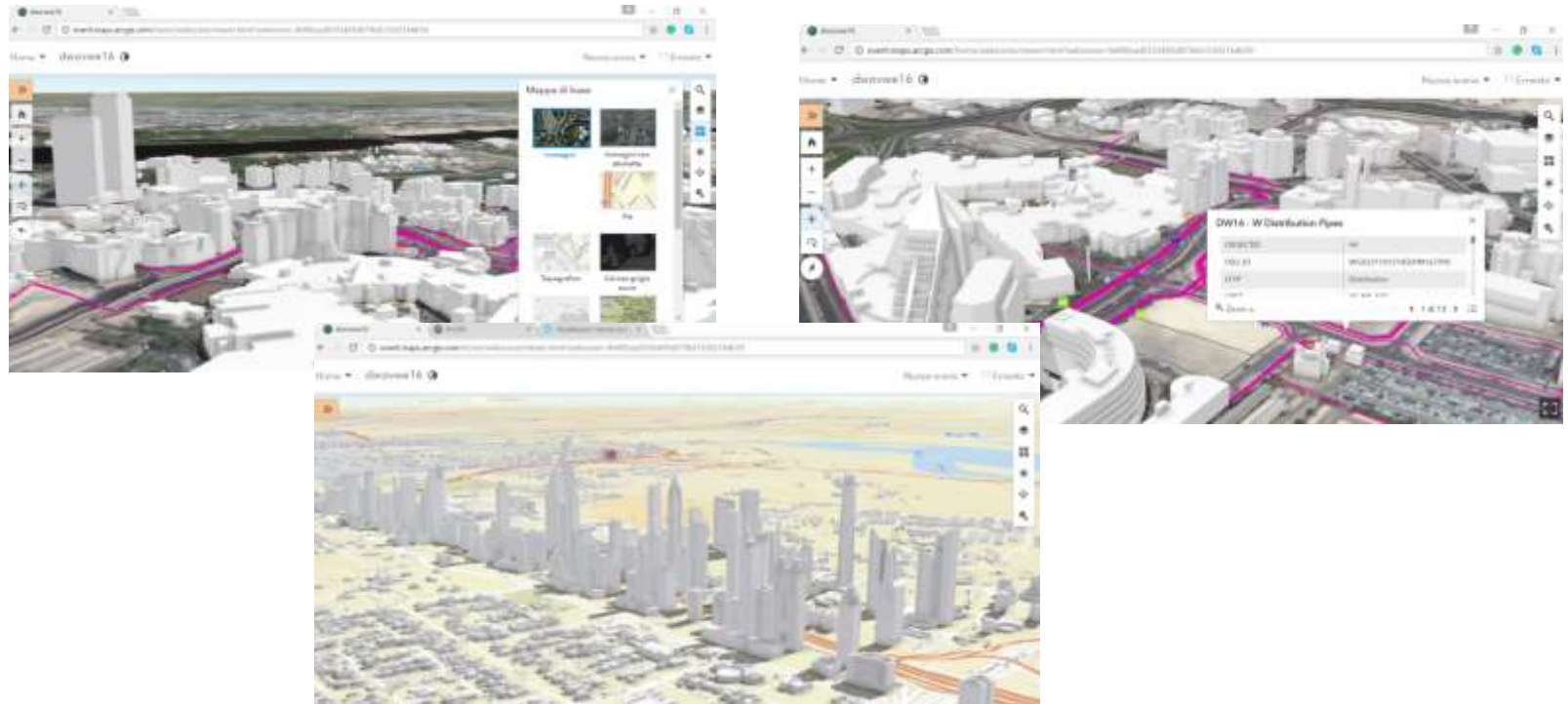


It is under test the 3D Engine for the plant visualization.

Esri City Engine has been chosen for the following benefits:

- Link with the GIS component and the association of graphic objects with attributes
- Easy design of 3D scenarios, realistic contexts simplifying design and reducing errors
- Possibility to share documents with other users
- ArcGis Desktop and its 3D ArcScene component
- City Engine format on ArcGis on line

# ESRI Web Scene



**The 3D web component exploits the potential of the new ESRI «Web Scene» environment through Geographic 3D Web Service and the mashup with the Feature Layers bound to the 3D project.**

The feature layers is made possible by ArcMap publication through ArcGIS Server

# ArcGIS Earth



**The same network (the same web services) was used for ArcGIS Earth extension in conjunction with 3D models**

# Augmented Reality on smartglasses

**The technological evolution for Augmented Reality**

Navigazione  
"hands free"

Remote  
support

3D GIS

Virtual  
learning

Immersive  
navigation





# The wearable mobility

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The wearable mobility





# Thanks for your attention



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